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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/567,809	04/25/2008	Shunichi Sato	2271/75845	6291
23432 7590 04/21/2009 COOPER & DUNHAM, LLP 30 Rockefeller Plaza 20th Floor NEW YORK, NY 10112				
EXAMINER				
PARK, KINAM				
ART UNIT		PAPER NUMBER		
2828				
MAIL DATE		DELIVERY MODE		
04/21/2009		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/567,809

**Applicant(s)**

SATO ET AL.

**Examiner**

KINAM PARK

**Art Unit**

2828

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 February 2009.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-3 is/are rejected.  
7) ☒ Claim(s) 4-10 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 07 February 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-850)  
Paper No(s)/Mail Date 2/7/2006  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

***DETAILED ACTION***

***Election/Restrictions***

1. Applicant's election without traverse of claims 1-10 in the reply filed on February 20, 2009 is acknowledged.
2. Claims 11-35 are cancelled from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on February 20, 2009.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Liu (Pub No. 20040091011).

Regarding **claim 1**,

Liu discloses in figure 149 and specification:

1. (original) A surface-emission laser diode, characterized by:  
a semiconductor substrate (p-GaAs substrate);  
a cavity region formed over said semiconductor substrate(p-GaAs substrate),  
said cavity region comprising: an active layer structural part (GaInNAs/ GaAs MQW)

including at least one quantum well active layer (GaInNAs, in GaInNAs/ GaAs MQW) producing a laser light and a barrier Layer (GaAs, in GaInNAs/ GaAs MQW); and a spacer layer (GaAs cavity spacer layer) provided in a vicinity of said active layer structural part, said spacer layer comprising at least one material (GaAs); and

an upper reflector (n-  $\text{Al}_{0.8}\text{Ga}_{0.2}\text{As}$  /GaAs DBR) and a lower reflector (p-  $\text{Al}_{0.8}\text{Ga}_{0.2}\text{As}$  /GaAs DBR) provided over said semiconductor substrate respectively at a top part and a bottom part of said cavity region,

said cavity region, said upper reflector (n-  $\text{Al}_{0.8}\text{Ga}_{0.2}\text{As}$  /GaAs DBR) and said lower reflector (p-  $\text{Al}_{0.8}\text{Ga}_{0.2}\text{As}$  /GaAs DBR) forming a mesa structure (see, figure 149) over said semiconductor substrate,

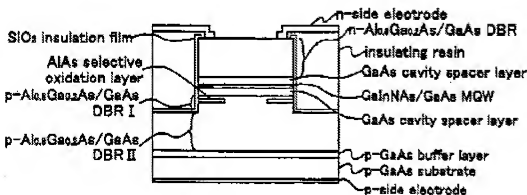
said upper reflector (n-  $\text{Al}_{0.8}\text{Ga}_{0.2}\text{As}$  /GaAs DBR) and said lower reflector (p-  $\text{Al}_{0.8}\text{Ga}_{0.2}\text{As}$  /GaAs DBR) constituting a semiconductor distributed Bragg reflector having a periodic change of refractive index and reflecting an incident light by interference of optical waves,

at least a part of said semiconductor distributed Bragg reflector being formed of a layer of small refractive index of  $\text{Al}_x\text{Ga}_{1-x}\text{As}$  ( $0 < x \leq 1$ ) and a layer of large refractive index of  $\text{Al}_y\text{Ga}_{1-y}\text{As}$  ( $0 \leq y < x \leq 1$ ) (see, paragraph [1200]),

said lower reflector being formed of a first lower reflector having a low-refractive index layer of AlAs and a second lower reflector formed on said first lower reflector, said second lower reflector having a low-refractive index, layer of AlGaAs (see, paragraph [1129], see, also, figure 138),

wherein at least one constituting said cavity region contains In (see, GaInNAs/ GaAs MQW)

**FIG.149**



Regarding claims 2-3,

Note that Liu discloses in figure 149 and specification at least, a lower spacer layer and an upper spacer layer contains In (see, paragraph [0456], here, GaInPAs) (claim 2), said second lower reflector, said low refractive index layer and said high refractive index layer are repeated by 10 pairs or less (see, paragraph [1199], here, Bragg reflector I (region I))(claim 3).

***Allowable Subject Matter***

5. Claims 4-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ramdani et al. (US 5633886) discloses the short wavelength VCSEL with Al-free active region.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kinam Park whose telephone number is (571) 270-1738. The examiner can normally be reached on from 9:00 AM-5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **MINSUN HARVEY**, can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/K. P./

Examiner, Art Unit 2828

/Minsun Harvey/  
Supervisory Patent Examiner, Art Unit 2828